

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



In re the application of:

Takayuki ARAKI et al.

Group Art Unit: 1714

Serial Number: 09/095,842

Examiner: P. Szekely

Filed: June 11, 1998

For: AQUEOUS DISPERSION OF VINYLIDENE FLUORIDE POLYMER AND
PREPARATION PROCESS THEREOF

DECLARATION UNDER 37 CFR 1.132

Honorable Commissioner

Washington, D.C. 20231

Sir,

Nobuhiko TSUDA, citizen of Japan, duly deposes and says:

1. That he graduated from Faculty of Engineering of Kyoto University, Japan, in the year 1987;
2. That he was employed in the capacity since 1987 by DAIKIN INDUSTRIES;
3. That he has been engaged in research and development on aqueous dispersions of fluorine-containing polymers;
4. That he has read and is familiar with the instant application for United States Letters Patent and the Office Action thereto mailed November 24, 1998;
5. That he experimented to prove that even if a fluorine-containing surfactant is solely present in an aqueous dispersion according to Claim 1 of U.S. Patent Application S.N. 09/095,842, the aqueous

dispersion is stable and give an almost clear dry film.

EXPERIMENTALS AND RESULTS

An aqueous dispersion (A) of a vinylidene fluoride (VdF) polymer was prepared according to the same conditions as Comparative Example 5 in the specification of U.S. Serial No. 09/095,842. The aqueous dispersion (A) of VdF polymer only contained ammonium salt of perfluoro(octanoic acid) (PFOA) in an amount of 2.0 % by weight to water as a surfactant. A solid content of the aqueous dispersion (A) was 31.5 % by weight, and an average particle size was 196.3 nm.

The aqueous dispersion (A) was introduced to a dialyzing tube of cellophane and was subjected to dialysis in a deionized water for 72 hours to obtain an diluted aqueous dispersion having a solid content of 15 % by weight.

The diluted aqueous dispersion was concentrated with an evaporator for 3 hours in hot-water bath of 80°C under reduced pressure of 180 mm Hg. A solid content of the concentrated aqueous dispersion (B) was 32.3 % by weight and an average particle size was 198 nm. As a result of measuring a content of PFOA of the concentrated aqueous dispersion (B) with high performance liquid chromatography, a content of PFOA was 0.78 % by weight to water.

The two aqueous dispersions, i.e. the aqueous dispersion (A) having a PFOA content of 2.0 % by weight and the concentrated aqueous dispersion (B) having a PFOA content of 0.78 % by weight were evaluated in the following tests.

1. Stability of aqueous dispersion:

The aqueous dispersions (A) and (B) were allowed to stand for

60 days at 25°C. There was no sedimentation with respect to both aqueous dispersions.

2. Precipitation in dry film:

Each 2 g of the aqueous dispersions (A) and (B) was pored to a 40 mm ϕ petri dish, and dried at 120°C for one hour to obtain a dry film. The dry film from the aqueous dispersion (A) was whitened due to PFOA, but the dry film from the aqueous dispersion (B) was almost clear.

DISCUSSION

The aqueous dispersion (B) of VdF polymer which contains only PFOA as a surfactant in a small amount of 0.78 % by weight is stable, even if the VdF polymer particle is very small and the solid content is high. Further, the aqueous dispersion (B) can produce a clear dry film in which PFOA is not precipitated.

The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

This 18th day of February, 1999

by Nobuhiko Tsuda
Nobuhiko Tsuda

We, the undersigned witnesses, hereby acknowledge that Nobuhiko Tsuda is personally known to us and did execute the foregoing Declaration in our presence on:

Date: February 18, 1999

Witness Norihito Nakajima

Date: February 18, 1999

Witness Hiroshi Uemoto